

## CLAIMS

1. A method of operating a packet data transmission system  
5 comprising a primary station (PS 1) having a plurality of antennas (PA1 – PA4)  
and at least one secondary station (SS1) having a plurality of antennas (SA1 –  
SA4), the method comprising the primary station (PS1) transmitting packet  
data on signal paths between pairs of primary and secondary station  
10 antennas, the secondary station (SS1) monitoring its radio environment and  
sending information about its radio environment to the primary station, the  
primary station (PS1) in response to this information adapting itself and the  
secondary station (SS1) configuring its receiver resources (RX1 – RX4) for  
processing the received data and interference.

15 2. A method as claimed in claim 1, characterised in that the  
secondary station (SS1) recommends to the primary station (PS 1) how it  
should adapt itself.

3. A method as claimed in claim 2, characterised in that the  
20 secondary station (SS1) recommends that the primary station (PS 1) use a  
particular subset of antennas for transmitting packet data.

4. A method as claimed in claim 2 or 3, characterised in that the  
secondary station (SS 1) recommends the maximum desired number of  
25 receivable transmission antennas to be used by the primary station (PS 1).

5. A method as claimed in any one of claims 2 to 4, characterised in  
that the secondary station (SS 1) recommends the transmission format to be  
used by the primary station (PS1).

6. A method as claimed in any one of claims 2 to 5, characterised in that the primary station (PS1) adapts itself as recommended by the secondary station (SS1).

5 7. A method as claimed in any one of claims 1 to 6, characterised in that the secondary station (SS1) determines the resources to be used for receiving packet data and the resources to be used for interference suppression.

10 8. A method as claimed in any one of claims 1 to 7, characterised in that the secondary station (SS1) monitors the transfer function of the paths between the primary and secondary stations antennas (PA1 – PA4, SA1 – SA4).

15 9. A method as claimed in any one of claims 1 to 8, characterised in that the information about the radio environment of the secondary station (SS1) includes characteristics of the interference present at one or more antennas (SA1 – SA4) of the secondary station (SS1).

20 10. A packet data transmission system comprising a primary station (PS1) having a plurality of antennas (PA1 – PA4), signal transmitting (TX1 – TX4) and receiving means (16) and means for adapting itself in response to a received signal from a secondary station (SS1), and at least one secondary station (SS1) having signal transmitting and receiving means (RX1 – RX4), a  
25 plurality of antennas (SA1 – SA4), means (18) for monitoring its radio environment and for transmitting a signal including information about its radio environment, and means (18) for configuring its receiver resources (RX1 – RX4) for processing data signals received from the adapted primary station (PS1) and interference.

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11. A system as claimed in claim 9, characterised in that the monitoring means (18) comprises means (18) for determining the transfer

functions of the radio paths between the primary station and secondary stations.

12. A secondary station (SS1) for use in a packet data transmission system comprising a primary station (PS1) having a plurality of antennas (PA1 – PA4) and signal transmitting (TX1 – TX4) and receiving means, the secondary station (SS1) having signal transmitting and receiving (RX1 – RX4) means, a plurality of antennas (SA1 – SA4) and means (18) for monitoring its radio environment and for transmitting a signal including information about its radio environment, and means (18) for configuring its receiver resources (RX1 – RX4) for processing received data signals and interference.

13. A primary station (PS1) for use in a packet data transmission system, the primary station (PS1) comprising a plurality of antenna (PA1 – PA4), signal transmitting (TX1 – TX4) and receiving means, and means (16) responsive to a received signal from a secondary station (SS1) for adapting the mode of transmission of the signals transmitted to the secondary station.